

# **Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North, Operable Unit 1-10, Group 1 Sites**

## **1. INTRODUCTION**

In accordance with the Federal Facility Agreement and Consent Order (FFA/CO)(U.S. Department of Energy Idaho Operations Office [DOE-ID] 1991) between the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Idaho Department of Environmental Quality (IDEQ), hereafter referred to as the Agencies, the DOE submits the following remedial design/remedial action (RD/RA) work plan for select locations at Test Area North (TAN). Under the current remediation management strategy outlined in the FFA/CO, the location identified for the remedial action is designated as Waste Area Group (WAG) 1, Operable Unit (OU) 1-10 at the Idaho National Engineering and Environmental Laboratory (INEEL).

The OU 1-10 remedial action, as part of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) (42 USC § 9601 et seq.) process, will proceed in accordance with the signed Final Record of Decision (ROD) for TAN OU 1-10 (DOE-ID 1999). This ROD presents the selected remedies for 62 sites evaluated under the OU 1-10 remedial investigation/feasibility study (RI/FS) (DOE-ID 1997a) and evaluates institutional controls for all 94 identified release sites at WAG 1, including the OU 1-07B ROD (DOE-ID 1995) "No Action" sites, where an unacceptable risk for unrestricted land use remains. Of these 94 sites, the ROD provides information to support remedial actions for eight sites where contamination presents an unacceptable risk to human health and the environment. Seven sites, plus three additional subareas of one remedial action site (Technical Support Facility [TSF]-06), were identified as "No Further Action" sites in the ROD and will require institutional controls. The WAG 1 institutional control plan (DOE-ID 2000a) will establish the requirements for the institutional control sites. Of the remaining sites, the Mercury Spill Area (TSF-08) was selected for a treatability study under WAG 10, and will be remediated as necessary under WAG 1 in the future; the TSF Injection Well (TSF-05) and Surrounding Groundwater Contamination (TSF-23) are being remediated under OU 1-07B. The Agencies concur that "No Action" will be taken at the remaining 76 sites - these sites allow unrestricted land use and will not require institutional controls nor five-year reviews.

The purpose of the RI/FS was to assess the investigations previously conducted for WAG 1, thoroughly investigate the sites not previously evaluated, and determine the overall risk posed by the WAG. The selected remedies, as identified in the ROD, are specific to each site. Of the eight sites requiring remedial action under the OU 1-10 ROD, four are addressed in this Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North, Operable Unit 1-10, Group 1 Sites. These sites and the planned remedial action start dates as outlined in the OU 1-10 RD/RA Scope of Work are in Table 1-1 (DOE-ID 2000e).

However, as identified in Section 1.3.1.4 of this RD/RAWP, remedial action at Water Reactor Research Test Facility (WRRTF)-13 will not be required. These schedules in no way preclude starting the remedial action at these sites earlier than planned, nor provide an enforceable schedule to start the remedial action.

**Table 1-1.** OU 1-10 Group 1 sites and planned remedial action start dates.

Site	Start Date
Soil Contamination Area South of the Turntable (TSF-06, Area B)	May 22, 2001
Disposal Pond (TSF-07)	November 14, 2000
PM-2A Tanks (TSF-26) Soil Excavation	May 22, 2001
Fuel Leak site WRRTF-13.	April 2, 2001

The remaining sites, in addition to the PM-2A Tank content removal, will be addressed in the Comprehensive Remedial Design/Remedial Action Work Plan for the Test Area North, Operable Unit 1-10, Group 2 Sites, scheduled to be submitted to the Agencies as a primary Draft June 2001. The Group 2 sites addressed and the planned remedial action start dates as outlined in the OU 1-10 RD/RA Scope of Work are in Table 1-2

For the OU 1-10 Group 2 sites, the schedules may be modified further in the Group 2 sites RD/RAWP.

## 1.1 Work Plan Organization

This work plan is designed as a handbook for implementing OU 1-10 RD/RA activities. The work plan and its support documents describe the sites, contaminants, project management, tasks, schedules, and cost estimates. The following are brief descriptions of the work plan sections and appendices:

- Section 1 describes the background and history of WAG 1 and gives an overview of the selected remedies for the areas of concern.
- Section 2 provides the design criteria, including the design codes and standards, assumptions, and quality assurance.
- Section 3 discusses the remedial design of the project. A summary of the required earthwork is presented, as well as controls for surface water and erosion. Subcontractor staging, postclosure monitoring, and the operation and maintenance (O&M) plan is introduced.
- Section 4 is the initial evaluation of WAG 1, which includes an evaluation of the potential risks to human health and the environment. Descriptions of existing site conditions, potential migration and exposure pathways, and an assessment of exposure routes are provided. Also, the remedial action objectives (RAOs) and applicable or relevant and appropriate requirements (ARARs) are identified.

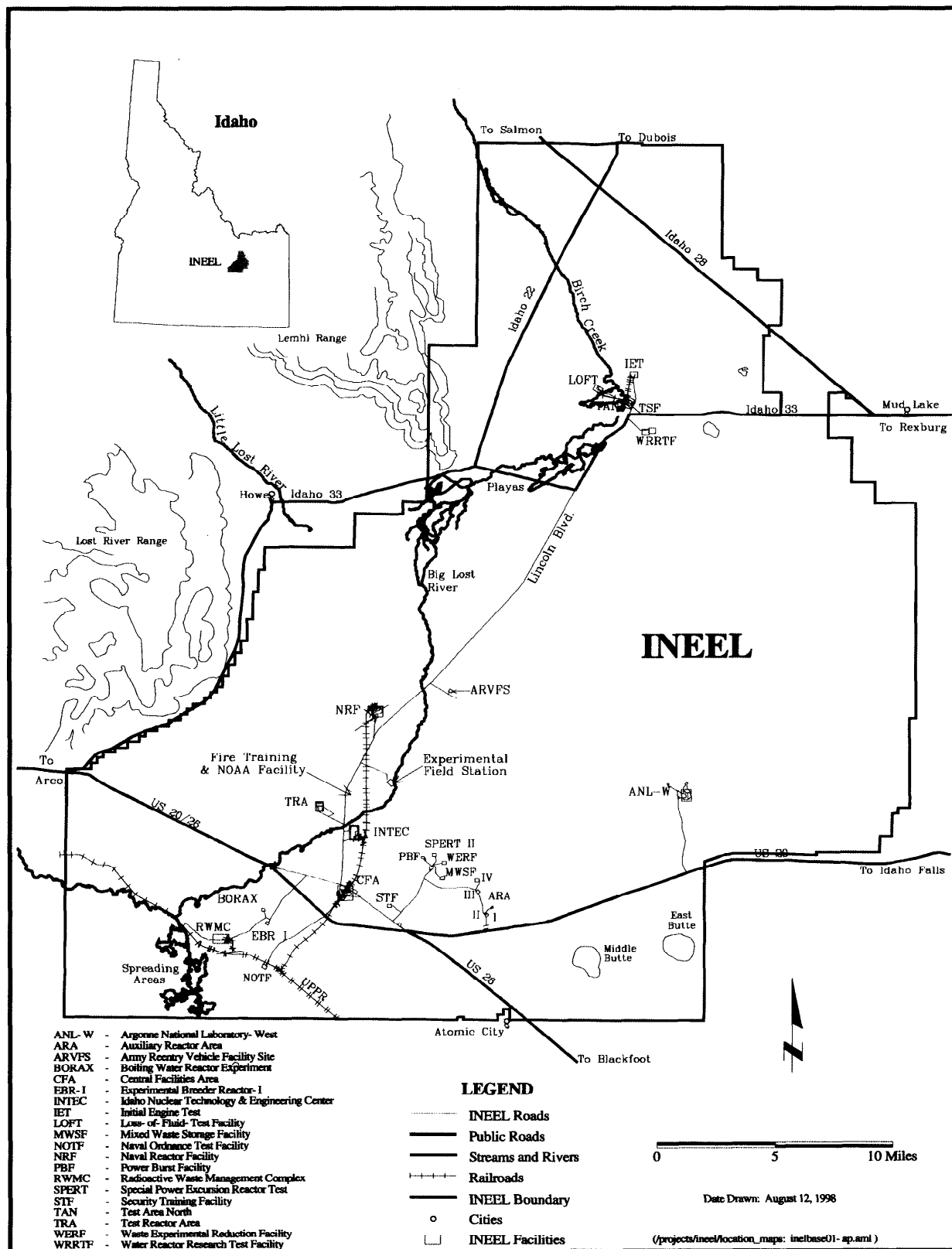
**Table 1-2.** OU 1-10 Group 2 sites and planned remedial action start dates.

Site	Start Date
Intermediate-Level (Radioactive) Waste Disposal System (TSF-09)	October 15, 2002
Contaminated Tank Southeast of Tank V-3 (TSF-18)	October 15, 2002
PM-2A Tanks (TSF-26) tank content removal	August 20, 2002
TSF Burn Pit (TSF-03)	March 23, 2004
WRRTF Burn Pits I, II, III and IV (WRRTF-01)	March 23, 2004

- Section 5 outlines the OU 1-10 remedial action work plan. This section includes the necessary steps and documentation required to complete the remedial action described in Sections 1 through 4. Remedial action work tasks, project cost estimates, inspections, and environmental and safety plans are included in this section.
- Section 6 describes the necessary actions involved for each five-year review by the Agencies to occur after the remedial action has taken place.
- Section 7 is a listing of reference material.
- Appendix A, Design Drawings, contains drawings that detail the present conditions (topography, fencing, etc.) at each site, as well as the work to be performed during the remedial action. (Note: Appendix A design drawings will not be complete until the results of post-ROD sampling at TSF-06 Area B and TSF-26 are obtained).
- Appendix B, Technical Specifications for Test Area North, Waste Area Group 1, Remedial Design/Remedial Action, Operable Unit 1-10, contains the specifications that provide the general terms and conditions for the subcontractor to complete the remedial action.
- Appendix C, Quality Level Evaluation, assigns a quality level to the remedial action.
- Appendix D, Air Emissions Modeling Results, presents a summary of the results of the air emissions to satisfy project ARARs.
- Appendix E, Selected Remedy Cost Estimates, provides costs for each remedial activity addressed in this RD/RA work plan.
- Appendix F, WRRTF-13 Post-ROD Sampling Data and Risk Based Corrective Action (RBCA) Analysis, provides information regarding the results of the post-ROD sampling activities at WRRTF-13 and the results of the State of Idaho RBCA Guidance (IDEQ 1996a) analysis.
- Appendix G, Comment Resolution Forms for Draft remedial Design/Remedial Action Work Plan and Associated Documents, provides the comment resolution forms that were used to resolve the Draft comments on the RD/RAWP and associated documents.

## 1.2 Background

The INEEL is a government-owned/contractor operated facility managed by the DOE-ID (Figure 1-1), located 51 km (32 mi) west of Idaho Falls, Idaho. The INEEL occupies 2,305 km<sup>2</sup> (890 mi<sup>2</sup>) of the northeastern portion of the Eastern Snake River Plain, and encompasses portions of five Idaho counties: (1) Butte, (2) Jefferson, (3) Bonneville, (4) Clark, and (5) Bingham County. TAN is located at the northern end of the INEEL, and was originally built between 1954 and 1961 to support the Aircraft Nuclear Propulsion Program sponsored by the U.S. Air Force and the Atomic Energy Commission. The program's objectives were to develop and test designs for nuclear-powered aircraft engines. Upon termination of this research in 1961, the area's facilities were converted to support a variety of other DOE research projects.



**Figure 1-1.** Location of Test Area North at the Idaho National Engineering and Environmental Laboratory.

From 1962 through the 1970s, the area supported reactor safety testing and behavior studies at the Loss-of-Fluid Test Facility. Beginning in 1980, the area was used to conduct work with material from the 1979 Three Mile Island reactor accident. Current activities include the manufacture of armor for military vehicles at the Specific Manufacturing Capability Facility and nuclear inspection and storage operations at TSF and WRRTF. The Initial Engine Test Facility is currently being deactivated, decommissioned, and dismantled by the INEEL decontamination and dismantlement (D&D) program.

The following sections provide brief descriptions of the four sites at TAN covered under this specific RD/RA work plan that require remediation per the ROD. Figure 1-2 includes the Soil Contamination Area South of the Turntable, the Disposal Pond, and the PM-2A Tanks, and Figure 1-3 shows the Fuel Leak site. The contaminants of concern (COCs) for each of the sites and their associated final remediation goals (FRGs) are summarized in Table 1-3.

### **1.2.1 Soil Contamination Area South of the Turntable (TSF-06, Area B)**

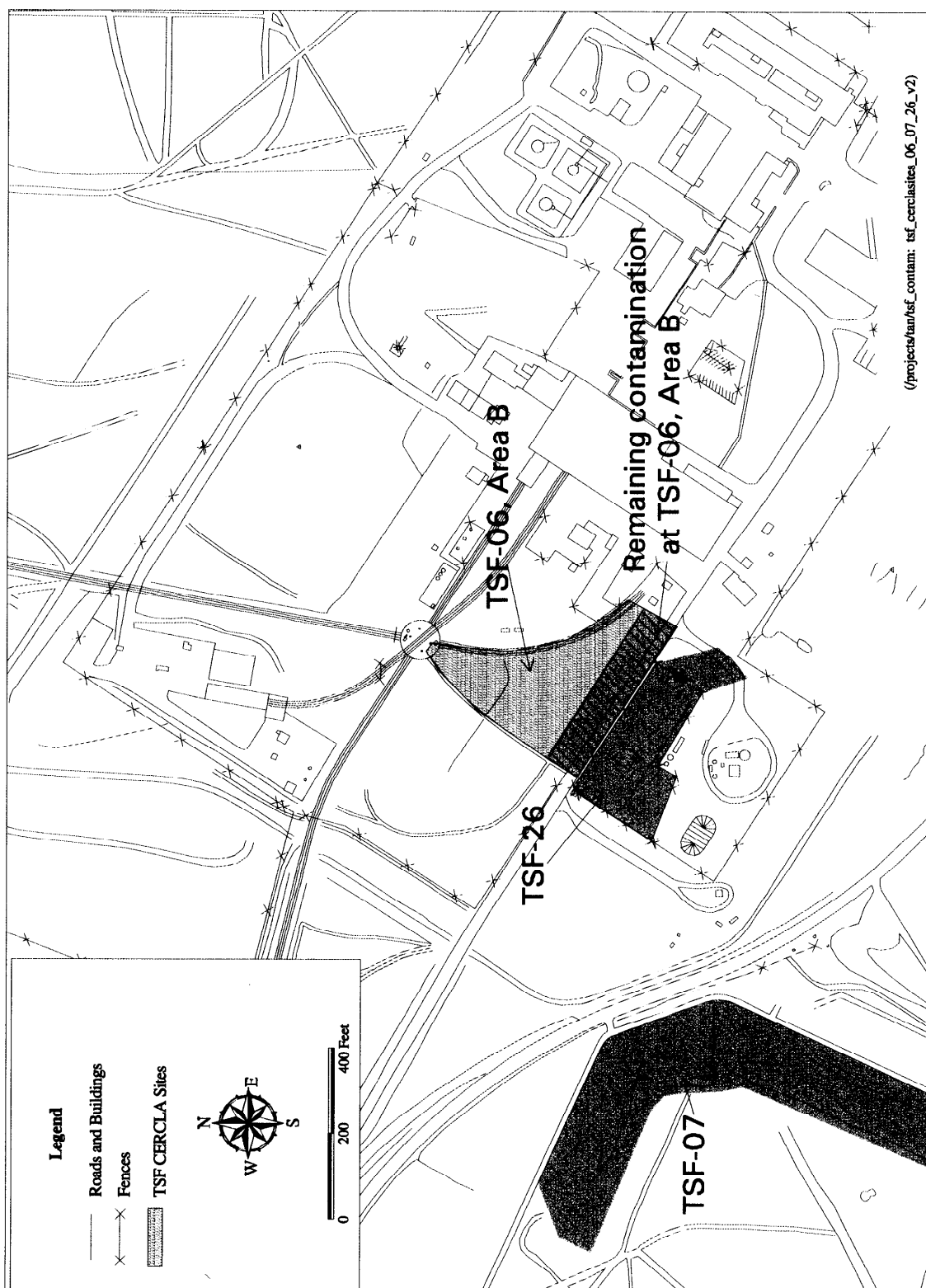
The Soil Contamination Area South of the Turntable is an open area bounded by the TSF fence on the west, and facility roads and several adjacent structures on the east and south (Figure 1-2). This area is roughly triangular, and measures 205.8-m (675-ft) wide on the south and 129.6 m (425 ft) on the west (DOE-ID 1997a).

Surface soil at the site was contaminated by windblown radioactive particles from the contaminated soils at the PM-2A Tanks area (TSF-26). Cesium-137 contamination remains in a 152- by 30.5-m (500- by 100-ft) area after the OU 10-06 removal action. This area has been surveyed routinely by TAN personnel and was covered with 0.3 to 0.6 m (1 to 2 ft) of soil in 1992 (INEEL 1994). This additional soil, added in 1992, is referred to as the TSF-06 overburden, and the underlying contaminated soil is referred to as the TSF-06 native soil. Since, 1992, the TSF-06 overburden has been contaminated with Cs-137 by windblown contamination from stockpiles at the PM-2A Tanks site (Section 1.2.3). Post-ROD sampling was performed on the TSF-06 overburden to identify the contaminated area. In order to complete post-ROD sampling, the TSF-06 overburden was removed; soil greater than the FRG was placed in soil bags for disposal and soil less than the FRG was stockpiled separately. Section 2.9.1 further explains the sampling and removal of TSF-06 overburden. Post-ROD radiological sampling of the TSF-06 native soil will further identify areas that are greater than the 23.3 pCi/g Cs-137 FRG.

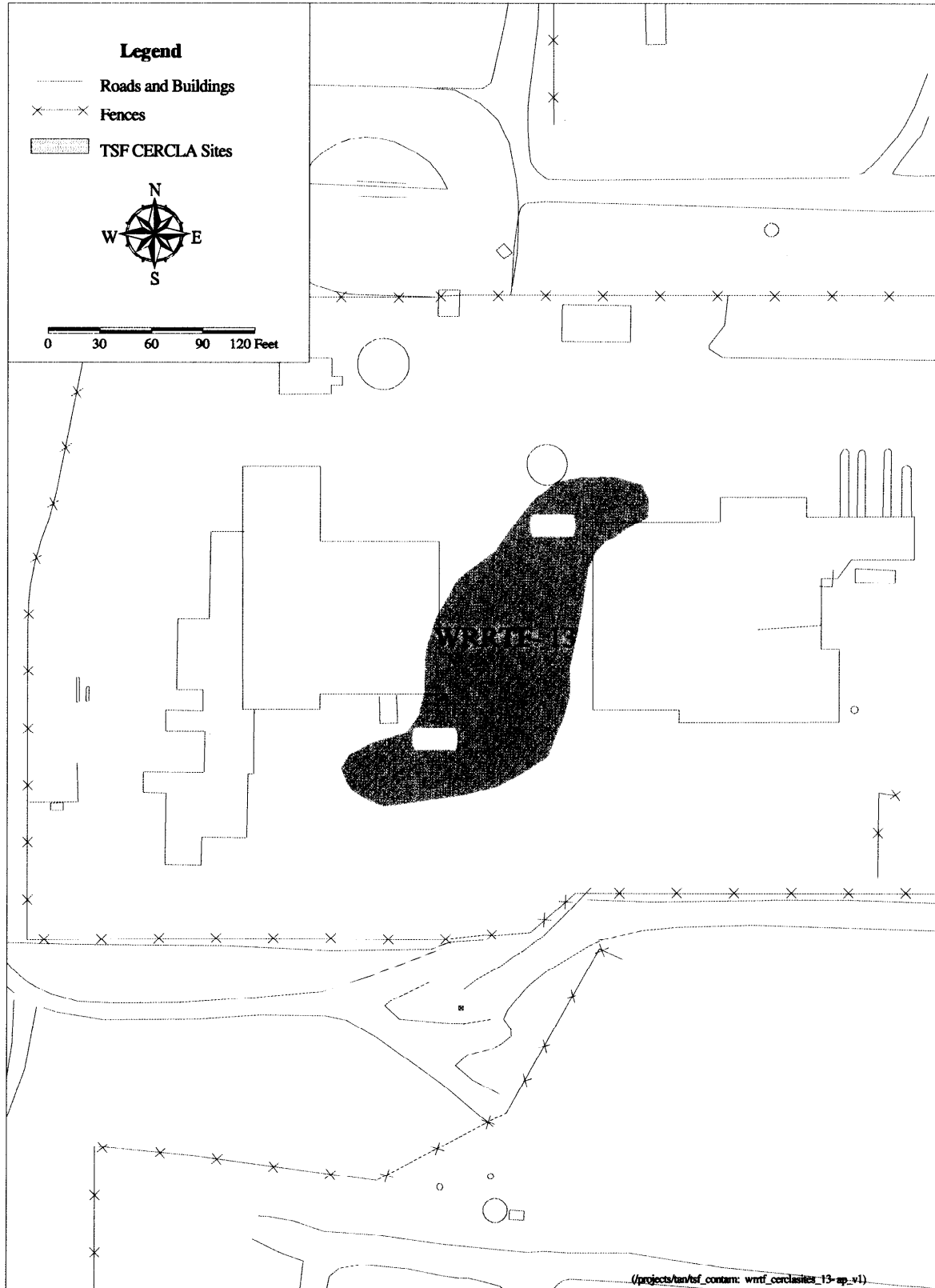
The COC at the site is Cs-137. A layer of radionuclide contamination is suspected to be limited to beneath the overburden soil, at a depth of 0.3 to 0.6 m (1 to 2 ft). Contaminated soil exceeding the Cs-137 FRG of 23.3 pCi/g will be excavated to a maximum depth of 3 m (10 ft) below ground surface (bgs). Cesium-137 contaminated soil is suspected to extend underneath Snake Avenue. The TSF-06 remedial action will include removing the Snake Avenue asphalt, sampling the underlying soils for Cs-137, and excavating soils exceeding the Cs-137 FRG of 23.3 pCi/g under Snake Avenue, to a maximum depth of 3 m (10 ft) bgs. Contaminated soils from this area will be excavated for on-Site disposal, if a suitable on-Site soil repository is available at the time of the removal action. Waste management for this site will depend upon a no-longer contained-in determination, which will be prepared and submitted to IDEQ with the results of post-ROD sampling.

### **1.2.2 Disposal Pond (TSF-07)**

The Disposal Pond is a 14-ha (35-acre), unlined disposal pond in the southwest portion of TSF. The Disposal Pond is surrounded by a 1.5-m (5-ft) tall berm. Based on available field screening data, 12-ha (30 acre) of the Disposal Pond have never received wastewater and are not contaminated.



**Figure 1-2.** Soil Contamination Area South of the Turntable (TSF-06, Area B), Disposal Pond (TSF-07), and PM-2A Tanks (TSF-26).



**Figure 1-3.** Fuel Leak site (WRRTF-13).

**Table 1-3.** Contaminants of concern and final remediation goals for the OU 1-10 selected sites.

Site	Contaminants of Concern	Final Remediation Goal
Soil Contamination Area South of Turntable (TSF-06, Area B)	Cs-137	23.3 pCi/g <sup>a</sup>
Disposal Pond (TSF-07)	Cs-137	23.3 pCi/g <sup>a</sup>
PM-2A Tanks (TSF-26)	Cs-137	23.3 pCi/g <sup>a</sup>
Fuel Leak site (WRRTF-13)	Petroleum hydrocarbon constituents	NA <sup>b</sup>

a. The final remediation goal of 23.3 pCi/g for Cs-137 at this site will allow unrestricted land use in 100 years. Therefore, institutional controls will be used at this site until it is available for unrestricted land use. The WAG 1 institutional control plan (DOE-ID 2000a) will implement all institutional control requirements for WAG 1.

b. The final remediation goal at WRRTF-13 is not applicable because the site will not require remedial action to meet State of Idaho RBCA requirements. Appendix F contains the RBCA analysis for this site.

NA = not applicable

The remaining 2-ha (5-acre) in the northeast corner and on the eastern edge of the pond have been contaminated with Cs-137 and metals. However, it was assumed in the RI/FS that the area of contamination covers the entire main pond and overflow pond surfaces. Previous sampling activities indicate that the Cs-137 has migrated to approximately 3-m (11-ft) below the bottom of the pond in this area. Historically, the pond received sanitary waste discharges, low-level radioactive waste, industrial wastewater, and treated sewage effluent.

The Disposal Pond replaced the TSF-05 Injection Well, and began receiving wastewater in September 1972. The pond received wastewater from a variety of sources that included sanitary waste discharges, low-level radioactive waste, cold process water, and treated sewage effluent that originated from TAN service buildings and process.

Current discharges to a 1-ha (2.5 acres) portion of the Disposal Pond are permitted by the State of Idaho to receive sanitary and industrial waste (DOE-ID 1997a). In addition, a section of the pond was portioned in 1992-1993 for discharge of treated effluent from the *TSF-05 Injection Well Contaminated Groundwater OU 1-074 Interim Action* (DOE-ID 1997b). This active portion of the pond will undergo assessments when operations cease.

The selected remedial action at this site will consist of institutional controls and environmental monitoring. Details of the required institutional controls at the site will be provided in the WAG 1 institutional control plan (DOE-ID 2000a). Details of the environmental monitoring at this site is in the operations and maintenance plan (DOE-ID 2000c).

### 1.2.3 PM-2A Tanks Site Soil Contamination Area (TSF-26)

The PM-2A Tanks consists of the contaminated surface soil surrounding two abandoned underground storage tanks (see Figure 1-2). The tanks were installed in the mid-1950s and stored concentrated low-level radioactive waste from the TAN-616 Evaporator from 1955 to 1972 (DOE-ID 1997a). In 1972, a new evaporator system (the PM-2A System) was installed in the TSF-26 area to replace the existing TAN-616 Evaporator System, which was failing. The tanks served as feed tanks for the new evaporator system in which liquid waste was evaporated, condensed, passed through an



ion-exchange column, and discharged as clean water into the Disposal Pond (TSF-07). The system was shut down in 1975 because of operational difficulties and spills (DOE-ID 1997a).

During the 1981 and 1982 D&D of the PM-2A Tanks site, most of the liquid in the PM-2A Tanks was pumped out into concrete containers, mixed with cement, and shipped to the Radioactive Waste Management Complex (RWMC) for burial. The residual liquid was absorbed by material incorporated into the tanks to absorb free liquid (DOE-ID 1997a). This sludge mixture is contaminated with radionuclides, metals, organic compounds, and polychlorinated biphenyls (PCBs) (DOE-ID 1999).

The soil above the tanks was contaminated by spills containing radionuclides and hazardous constituents, including metals, (barium, cadmium, chromium, lead, mercury, and silver), volatile organic compounds (VOCs) (trichloroethene, 1,1,1-trichloroethane, carbon tetrachloride, and acetone), semivolatile organic compound (SVOCs), PCBs, and radionuclides (Cs-137, Co-60, and Sr-90) when waste was transferred from the tanks. The only contaminants in the soils based on recent sampling at TSF-26 are radionuclides, primarily Cs-137. The soils must still be managed as F001 listed based on process knowledge.

Contaminated soil was removed in 1996, as part of the OU 10-06 removal action. What appeared to be the top of a wooden box was discovered at the PM-2A Tanks during the 1996 OU 10-06 removal action. Three soil stockpiles remain at the PM-2A Tanks after the OU 10-06 removal action because gamma radiation readings from the stockpiles were greater than allowed by the project work control documentation at the time. From past removal actions, the PM-2A Tanks site is an average of 1.5 m (5 ft) below surrounding land surface. The remedial action requires excavation to 3 m (10 ft) below land surface (bls) from the surrounding elevation. Therefore, an average of 1.5 m (5 ft) will be further removed from this area.

The PM-2A Tank remedial action that will occur under this work plan will be placement of clean fill material over the entire area to mitigate further contaminant migration until remedial action can occur, and the excavation and disposal of soils greater than the FRG of 23.3 pCi/g Cs-137, to a maximum depth of 3 m (10 ft) bls from the surrounding land surface. The remaining remedial action at this site will include removal and disposal of the tank contents, decontamination of the tanks, filling the tanks with inert material, and backfilling the PM-2A area to surrounding contours. This remaining work will be performed under the OU 1-10 Group 2 RD/RA Work Plan. Waste management for this site will depend upon a no-longer contained-in determination, which may be prepared and submitted to IDEQ.

#### **1.2.4 Fuel Leak Site (WRRTF-13)**

The WRRTF-13 Fuel Leak site is defined as the WRRTF Fuel Leak site/Contamination Plume that is under the area where tanks were removed. The tanks, TAN-738, TAN-739, and TAN-787, were located between TAN Buildings 641 and 645 (Figure 1-3). Numerous diesel and heating fuel tanks and transfer lines have supplied the buildings within WRRTF during its operational life. Most of these tanks and lines have been taken out of service and removed. Several of the tanks and transfer lines, including Tanks TAN-738, TAN-739, and TAN-787, were removed and disposed in the early 1990s. Contaminated soil associated with these tanks was encountered and removed, and the excavated areas were backfilled with clean soil (DOE-ID 1999). However, residual contamination remains in soil below and adjacent to several buildings currently in use at TAN (DOE-ID 1999). It has been determined that this residual contamination in the subsurface resulted from leaks and spills of diesel fuel at the former locations of Tanks TAN-738, TAN-739, and TAN-787, and the transfer piping between Tanks TAN-787 and TAN-738.

Tank TAN-738 was installed in 1959 and supplied heating oil to the boilers in Building TAN-641. In 1963, Tank TAN-787 was installed. It was connected to Tank TAN-738 in 1976 when a 3.8-cm (1.5-in.) stainless steel line was installed, along with new boilers in Building TAN-641. The tanks and piping remained in active service until 1991. TAN-738 was taken out of service in September 1991, and the transfer line was modified to allow the boilers in TAN-641 to be fed directly from Tank TAN-787. When taken out of operation, the Tank TAN-738 had deteriorated, and the remaining oil was transferred into Tank TAN-787. During a start-up test of the boilers in October 1991, an estimated 7,949 to 13,627 L (2,100 to 3,600 gal) of diesel fuel was unaccounted for. It was suspected that either the transfer line was leaking or the boiler meters were not functioning properly. A pressure leak test indicated that a portion of the transfer piping was leaking. During excavation of the transfer line, the soil below the piping appeared discolored and smelled strongly of petroleum products. Tanks TAN-738 and TAN-787 were removed in December 1991. When removed, TAN-738 contained numerous small holes, and soil below the tank both smelled and appeared contaminated with diesel fuel. Tank TAN-738 was replaced in 1991 by a 22,711-L (6,000-gal) stainless steel diesel fuel tank, which is currently in use (DOE-ID 1997c).

Because of analytical data limitations from previous investigations, soil sampling for benzene, toluene, ethylbenzene, and xylenes and polynuclear aromatic hydrocarbons was conducted as part of the post-ROD sampling to evaluate data against the State of Idaho RBCA Guidance (IDEQ 1996a) to determine the FRG and to determine the volume of contaminated soil, if any, that must be excavated and land farmed. Post-ROD sampling at WRRTF-13 began February 28, 2000 and concluded March 2, 2000. The sample locations and sampling approach are given in the post-ROD field sampling plan (DOE-ID 2000c).

Seven borehole locations were selected based on site history to bias the samples toward areas of highest contamination. Borehole 1 was placed at the former location of tank TAN-738, which was known to have leaked, Borehole 2 was placed adjacent to tanks TAN-738 and -739. Boreholes 3 through 6 were placed along transfer piping that was known to have leaked. Finally, Borehole 7 was placed at the former location of tank TAN-787.

A Risk Based Corrective Action (RBCA) analysis was performed on the data received from the analytical laboratory. The maximum concentration of each detected contaminant from all the samples collected were compared to the State of Idaho RBCA Tier 0 and Tier 1 screening concentrations. The maximum concentrations from this site exceeded both the Tier 0 and Tier 1 RBCA screening concentrations. To complete the RBCA analysis, a Tier 2 evaluation was done using the RBCA Software (State of Idaho RBCA Tier 2 Software Ver 1.0 July 1997). Input data to the RBCA software included: maximum concentrations, current land use is occupational, future land use will be residential, no surficial contaminated soil (which precluded calculating resident child risks due to soil ingestion), and identifying that the groundwater class is 2 since this flow rate is closer to the Snake River Plain Aquifer flow rate. The output for this evaluation is provided in Appendix F. As presented on page F1-1, the cumulative risk at this site for the residential scenario is  $1.17\text{E-}08$  and the cumulative Hazard Index (HI) is 0.96. The cumulative risk for an industrial scenario is  $2.65\text{E-}09$  and the cumulative HI is 0.42. The Subsurface Soil Indoor Inhalation exposure pathway is the main contributor to the cumulative HI. The results of the RBCA Tier 2 analysis are below the Tier 2 evaluation criteria of  $1\text{E-}05$  cumulative risk and a HI of 1.

The WRRTF-13 Site requires no remedial action, as determined from RBCA analysis. Thus, the site has been reclassified as a "No Action" site. Institutional controls will not be required at the Fuel Leak site (WRRTF-13).

## 1.3 Selected Remedy

The Agencies have selected the following remedies for the OU 1-10 sites addressed in this RD/RAWP, based on consideration of the requirements of CERCLA, the detailed analysis of alternatives, and public comments. Performance standards were implemented as design criteria for each of the four sites to ensure that the selected remedy is protective of human health and the environment. Five-year reviews will be used at all sites where contamination remains with risk  $>1\text{E-}04$  to ensure that the selected remedy for the sites remains protective and appropriate. Confirmation sampling will be conducted at the two sites to be remediated by excavation to verify that RAOs and FRGs are met.

### 1.3.1 Description of Selected Remedy

The selected remedies for each of the four sites are described in the following sections.

**1.3.1.1 Soil Contamination Area South of the Turntable (TSF-06, Area B).** The selected remedy for the Soil Contamination Area South of the Turntable is Excavation and Disposal. This remedy is consistent with previous removal actions at TAN and will consolidate the low-level radionuclide-contaminated soil/sediments in a centralized repository. Excavation will involve removal of soils above 23.3 pCi/g Cs-137 to a maximum depth of 3 m (10 ft), and includes contaminated soil that may be identified under Snake Avenue as part of the TSF-06, Area B remedial action. Excavated soils will be disposed at the proposed INEEL CERCLA Disposal Facility (ICDF), RWMC, or another facility on or off the INEEL. Verification sampling will be conducted to ensure that all contamination present above the FRG is removed. The excavated areas will be backfilled with clean soil and seeded after excavation. Institutional controls will be maintained until the site is available for unrestricted land use, and will be reevaluated during five-year reviews.

**1.3.1.2 Disposal Pond (TSF-07).** The selected remedy for the Disposal Pond is Limited Action. This remedy is specific to implementing existing management practices, including institutional controls and environmental monitoring, and will continue until the Agencies agree that this site no longer poses an imminent and substantial endangerment to human health and the environment. This selected remedy includes installation of warning signs to prevent access. Although contamination will remain in place, the radioactivity will decay to less than unrestricted land use concentrations within the period of institutional controls. Implementation of institutional controls and environmental monitoring will be expanded to accommodate site-specific concerns as needed. Details of the warning signs and administrative controls to be used at the Disposal Pond are in the WAG 1 institutional control plan (DOE-ID 2000a).

The OU 1-10 ROD states that no-longer contained-in (NLCI) sampling will be performed at the Disposal Pond (TSF-07). However, the IDEQ has indicated that a NLCI determination is used to remove Resource Conservation and Recovery Act (RCRA) waste codes for generated wastes. The Limited Action remedy at the Disposal Pond will not generate wastes that will require a NLCI determination for disposal. Therefore, a NLCI determination and NLCI sampling are not required for the Disposal Pond (TSF-07).

**Note:** *The pond will continue to receive wastewater until TSF ceases operation approximately 25 years in the future.*

**1.3.1.3 PM-2A Tanks Site Soil Contamination Area (TSF-26).** The selected remedy for the PM-2A Tanks is Soil Excavation, Tank Content Vacuum Removal, Treatment, and Disposal. The soil excavation and disposal tasks at the PM-2A Tanks to a maximum depth of 3 m (10 ft) bls will be completed as part of the Group 1 sites RD/RAWP; the remaining tank content vacuum removal and

treatment, if required, will be completed as part of the subsequent Group 2 sites RD/RA work plan. Excavation will involve removing contaminated soil that is above the 23.3 pCi/g FRG for Cs-137 to a maximum depth of 3 m (10 ft), and packaging and transporting the soil for disposal at the ICDF, RWMC, or another facility on or off the INEEL. The disposal is also applicable to the TSF-26 stockpiles and wooden box that were bagged to support post-ROD sampling activities. Using radiological screening, uncontaminated soils (those with activities less than the FRG) will be stockpiled separately from the contaminated soils. Waste characterization sampling will be conducted on the stockpiled soils. Verification sampling will be conducted to ensure that all contamination present above the FRG is removed.

Based on the sampling results, uncontaminated soil will be placed over any remaining contaminated soil greater than a depth of 3 m (10 ft) bls to prevent further spread of contamination. Backfilled areas will be seeded to minimize erosion. Institutional controls will be evaluated based on the results of the verification sampling. Institutional control will be maintained until the site is available for unrestricted land use, and will be reevaluated during five-year reviews.

**1.3.1.4 Fuel Leak Site (WRRTF-13).** The remedy selected in the ROD for the Fuel Leak site was Excavation and Land Farming of contaminated soil exceeding the FRG. Post-ROD sampling was conducted at this site as discussed in Section 1.2.4 of this RD/RAWP. Based on the sample results and the current and future land use assumptions for this site, the RBCA Tier 2 evaluation, as presented in Appendix F, concludes contaminants at the site did not exceed FRGs. Thus, the site requires no remedial action activities. Remedial action at the WRRTF-13 site will not be discussed any further in this document.

## **2. DESIGN BASIS**

### **2.1 General Description of the Project Components**

The project components (support facilities, electrical power, and Title III services) are described in the following subsections.

#### **2.1.1 Support Facilities**

The location of the support facilities is identified on Drawing 1 (Appendix A). Support facilities to be used during the construction include subcontractor trailer(s), parking, laydown areas, and temporary stockpile area(s).

#### **2.1.2 Electrical Power**

Electrical power is available at the TSF facility for project use.

#### **2.1.3 Title III Services**

Title III services are provided by the INEEL Management and Operation (M&O) contractor, on an as-needed basis, for engineering support during preconstruction, construction, and at construction closeout. The INEEL M&O contractor will assist in reviewing construction interface documents and subcontractor vendor data submittals. During construction, the INEEL M&O contractor will provide a representative(s), as requested, to evaluate design modifications.

## **2.2 Design Criteria**

The objective of this remedial action is to inhibit potential exposure for human and environmental receptors and to minimize the spread of contamination. For the Soil Contamination Area South of the Turntable and the PM-2A Tanks soils, the objective will be accomplished through excavation of the soils with contamination present above the FRG and disposal of these soils in the proposed ICDF or another facility that can accept these soils. For the Disposal Pond, the objective will be accomplished by continuing to use existing management practices, including institutional controls and environmental monitoring. The objective has already been achieved at the Fuel Leak site, based upon results presented in Appendix F.

#### **2.2.1 Management and Operation Control Procedures**

Title I, II, and III will be performed in compliance with pertinent INEEL M&O contractor management control procedures (MCPs). Current MCPs can be found on the INEEL intranet. MCPs for this project are those identifying requirements in the following areas:

- Engineering Design
- Emergency Preparedness and Management
- Fire Protection
- Management Systems

- Occupational Safety and Health
- Radiological Protection
- Security
- Environmental Restoration
- Waste Management
- Conduct of Maintenance
- Quality.

## **2.2.2 Soil Contamination Area South of the Turntable (TSF-06, Area B)**

The Soil Contamination Area South of the Turntable design criteria include:

- Preparation of a hazardous waste determination (HWD) to determine final waste disposition for remedial action waste in compliance with 40 Code of Federal Regulations (CFR) 262.11. An INEEL Waste Determination and Disposition Form (WDDF) (Form 435.39) will serve as the HWD and is in compliance with 40 CFR 262.11.
- Excavation of contaminated soil exceeding the 23.3 pCi/g Cs-137 FRG, and storage of the waste in a CERCLA Storage Area until shipment to the disposal facility
- Removal of Snake Avenue for sampling and possible excavation, and the replacement of Snake Avenue
- Post-remediation sampling after excavation to verify FRGs are met
- Excavation activities to be coordinated with TSF and TAN operations
- Use of locally available, naturally occurring, clean fill material found at the INEEL, to the extent practicable
- Compacting, contouring, grading, and seeding with native vegetation
- Institutional controls will be required based upon the results of confirmation sampling at the completion of the remedial action.

## **2.2.3 Disposal Pond (TSF-07)**

The Disposal Pond design criteria include:

- Preparation of a HWD to determine final waste disposition for personal protective equipment, debris, and other wastes in compliance with 40 CFR 262.11. An INEEL WDDF will serve as the HWD and is in compliance with 40 CFR 262.11.
- The limited remedial activities will be coordinated with TSF and TAN operations.

- New warning signs will be attached to the Radiation Control fence around the perimeter of the Disposal Pond, as designated in the WAG 1 institutional control plan (DOE-ID 2000a).

#### **2.2.4 PM-2A Tanks (TSF-26)**

The PM-2A Tanks design criteria include:

- Preparation of a HWD to determine final waste disposition for remedial action waste in compliance with 40 CFR 262.11. An INEEL WDDF will serve as the HWD and is in compliance with 40 CFR 262.11
- Excavation of contaminated soil exceeding the 23.3 pCi/g Cs-137 FRG, and storage of the waste in a CERCLA Storage Area until shipment to the disposal facility
- Removal and disposal of debris
- Excavation activities to be coordinated with TSF and TAN operations
- Postremediation sampling after excavation to verify FRGs are met
- Use of locally available, naturally occurring, clean fill material found at the INEEL, to the extent practicable
- Compacting, contouring, grading, and seeding with native vegetation
- Institutional controls will be required based upon the results of confirmation sampling at the completion of the Group 2 remedial action.

### **2.3 DOE Related Codes, Standards, and Documentation**

The following national standards, codes, and regulations and subtier standards, codes, and regulations, and site-specific documents will be used as the basis for the remediation of OU 1-10:

- DOE Order 5480.4, *Environmental Protection, Safety, and Health Protection Standards*
- DOE Order 435.1, Chapter IV, *Radioactive Waste Management*
- DOE Order 5400.5, *Radiation Protection of the Public and the Environment*
- DOE Order 414.1A, *Quality Assurance*
- DOE Order 232.1A, *Occurrence Reporting and Processing of Operations Information*
- DOE Order 231.1, *Environment, Safety, and Health Reporting*
- DOE Order 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*
- DOE Order 470.1, *Safeguards and Security Program.*

## **2.4 Engineering Standards**

Appendix B contains references to the latest engineering standards and the specifications to which they apply.

## **2.5 Regulatory Requirements**

A detailed discussion of the ARARs is presented in Section 4 of this work plan.

## **2.6 General Design Assumptions**

The bounding assumptions under which the RD/RA activities will be performed include the following for all sites:

1. Institutional controls will be implemented and maintained at all sites where risk  $>1E-04$ . The continued need for institutional controls will be evaluated by the Agencies during each five-year review (see the WAG 1 institutional controls plan for these sites [DOE-ID 2000a]).
2. The remedial design for Group 1 sites will occur in Fiscal Year (FY) 2000, and all remedial actions for Group 1 sites, except contingent remedy implementation, will occur between FY 2000 and FY 2004. The O&M and environmental monitoring will continue as agreed upon by the Agencies.
3. HWDs will be completed for miscellaneous wastes from all the sites after receipt of analytical data and before any removal actions at these sites. This will determine where waste generated from the remedial action will be disposed.
4. A post-ROD sampling and analysis plan was prepared and implemented with a post-ROD health and safety plan (HASP) to address data collection for TSF-06 Area B, TSF-26, and WRRTF-13.

## **2.7 Site Specific Design Assumptions**

The following sections address those assumptions that are specific to a particular remedial action:

### **2.7.1 Soil Contamination Area South of the Turntable (TSF-06, Area B):**

1. The assumption has been made that impacts to TAN operations will be kept to a minimum. Activities at TSF-06, Area B will close Snake Avenue, the main thoroughfare from the Specific Manufacturing Capability (SMC) area to the TSF area.
2. Contaminated soil exceeding the 23.3 pCi/g Cs-137 FRG will be excavated and disposed at the proposed ICDF or another facility that can accept this soil.
3. Excavation/disposal activities will begin as soon as practical.
4. Excavated material will be dispositioned based on validation or verification sampling, and is assumed to be acceptable for disposal at the proposed ICDF or another facility that can accept this soil.
5. Verification sampling will be required to ensure that FRGs have been met.



6. Radiological surveys will be conducted around the perimeter of the TSF-06, Area B Site annually. Out-year O&M will consist of inspecting subsidence, erosion, burrowing intruders, and correcting any found deficiencies. Details of the O&M are found in the OU 1-10 O&M plan (DOE-ID 2000c).
7. Five-year site reviews will be conducted to evaluate the effectiveness of the remedy.

#### **2.7.2 Disposal Pond (TSF-07):**

1. Existing administrative and institutional controls will be evaluated, and if deemed appropriate, will be revised with new, upgraded practices and controls. Details of institutional control requirements at the Disposal Pond are in the WAG 1 institutional control plan (DOE-ID 2000 a).
2. Radiological surveys around the perimeter of the Disposal Pond will be conducted annually, and sampling for Cs-137 will be conducted in 2071 to verify the site is available for unrestricted land use. No O&M is planned at this site at this time.
3. Impacts to TAN operations will be kept to a minimum.
4. Five-year site reviews will be conducted to evaluate the effectiveness of the remedy.

#### **2.7.3 PM-2A Tanks (TSF-26):**

1. Contaminated soil exceeding the FRG will be excavated to a maximum depth of 0.9 m (3 ft) and disposed at the proposed ICDF or another facility that can accept this soil.
2. Excavation/disposal activities will begin as soon as practical.
3. Excavated material will be dispositioned based on validation or verification sampling, and is assumed to be acceptable for disposal at the proposed ICDF or another facility that can accept this soil.
4. Verification sampling will be required to ensure that FRGs have been met.
5. Radiological surveys around the perimeter of the PM-2A Tanks will be conducted annually until final completion of remedial action at the site. However, long-term environmental monitoring will not be required following completion of the removal action. Out-year O&M will consist of inspecting subsidence, erosion, burrowing intruders, and correcting any found deficiencies. Details of the O&M are found in the OU 1-10 O&M plan (DOE-ID 2000c).
6. Five-year site reviews will be conducted to evaluate the effectiveness of the remedy.

## **2.8 Quality Assurance**

A quality level designation and record, included as Appendix C, has been prepared for all the activities of the project. A quality level of 3 has been deemed appropriate for this project. All design, procurement, and construction activities will be in accordance with the Quality Level 3 designation.

The *Implementing Project Management Plan for the INEEL Remediation Program*, (INEEL 1998a), hereinafter referred to as the project management plan, has been adopted for this project and is incorporated by reference. The guidance governs the functional activities, organization, and quality assurance/quality control protocols that will be used for this project.

Where applicable, the project specifications (Appendix B) will specify the quality assurance/quality control (QA/QC) procedures for the given task, consistent with guidance provided by the project management plan and the Quality Level 3 designation.

## **2.9 Post-ROD Sampling Summary**

This section briefly describes the activities associated with the post-ROD sampling and field screening. The field activities are modeled after the selected remedial actions presented in the ROD (DOE-ID 1999) at three identified OU 1-10 release sites (Soil Contamination Area South of the Turntable [TSF-06, Area B], PM-2A Tanks [TSF-26], and Fuel Leak site [WRRTF-13]). The sampling activities at each of the sites as addressed in the post-ROD field sampling plan (DOE-ID 2000c) are as follows.

### **2.9.1 Soil Contamination Area South of the Turntable (TSF-06, Area B)**

During post-ROD sampling activities it was identified through investigations with TAN Operations personnel and research into the history of the site, that the remaining contamination in the 152 m (500 ft) by 15 m (50 ft) area (not including the road), had 0.3 m (1 ft) to 0.6 m (2 ft) feet of clean fill material placed in this area by TAN Operations Radiation Control to shield from radioactive material. This overburden material was rad surveyed using the procedure as identified in the post-ROD field sampling plan (DOE-ID 2000c) and contaminated material with concentrations greater than the FRG of 23.3 pCi/g Cs-137 was removed, placed into soil bags, and is being stored in the Radioactive Parts Security Storage Area (RPSSA) at TAN as a potentially mixed and PCB waste until shipment to a disposal facility on or off the INEEL occurs. The potential presence of PCBs will be managed according to 40 CFR 761.50 (b)(7)(ii).

The contamination in the overburden came from windblown contamination from the PM-2A soil stockpiles. Once a NLCI determination is obtained for the stockpiles a NLCI determination for the overburden material will be generated based on the soil stockpile data and will be disposed of as low-level waste only. A total of approximately 420 m<sup>3</sup> (550 yd<sup>3</sup>) of contaminated material was removed and the remaining overburden material that was below the FRG for Cs-137 was scraped to the side to facilitate post-ROD rad surveying of the native soil. The rad survey of the native soil will identify areas where the soil concentration exceeds the FRG of 23.3 pCi/g Cs-137.

### **2.9.2 PM-2A Tanks Site Soil Contamination Area (TSF-26)**

Post-ROD sampling activities at the PM-2A Tanks will include sampling and analysis for: (1) three soil stockpiles, (2) wooden box, and (3) Cs-137 contamination delineation. Waste material generated at the PM-2A Tanks, including personal protective equipment PPE and sampling wastes, will be managed as potentially RCRA-listed (F001) waste, due to the suspected presence of trichloroethene, 1,1,1-trichloroethane, and carbon tetrachloride. The potential presence of PCBs will be managed according to 40 CFR 761.50(b)(7)(ii), taking into account the results of post-ROD PCB sampling at the site.

The following subsections further describe each of the three sampling activities at the PM-2A Tanks.

**2.9.2.1 Soil Stockpiles.** Three soil stockpiles remain at the PM-2A Tanks after the 1996 OU 10-06 removal action. Sampling data will be used to support a no-longer contained-in determination for the stockpiles. The stockpiled soils will be sampled for contaminants known to have been present in the PM-2A Tanks. Analyses will include Universal Treatment Standard metals, toxicity characteristic

leaching procedure metals, Contract Laboratory Program (CLP) VOCs, CLP SVOCs, PCBs, and gamma spectroscopy.

Once the samples were collected from the stockpiles, they were excavated and placed into soil bags and are being stored in the RPSSA at TAN until shipment to a disposal facility occurs. A total of 107 m<sup>3</sup> (140 yd<sup>3</sup>) of contaminated waste was generated.

**2.9.2.2 Wooden Box.** The top of what appeared to be a wooden box was discovered at the PM-2A Tanks during the 1996 OU 10-06 removal action. It was not sampled nor removed during the OU 10-06 removal action because the contents of the box were unknown. Samples will be collected from inside the wooden box and analyzed for Universal Treatment Standard (UTS) metals, toxicity characteristic leaching procedure metals, CLP VOCs, CLP SVOCs, PCBs, and gamma spectroscopy. Data obtained will be used to complete the OU 1-10 RD/RA work plan and to determine the appropriate disposition for the contents of the wooden box.

Once the samples were collected from the wooden box, it was excavated with additional soil surrounding the wooden box and placed into soil bags and are being stored in the RPSSA at TAN until shipment to a disposal facility occurs. A total of 8 m<sup>3</sup> (10 yd<sup>3</sup>) of contaminated waste was generated.

**2.9.2.3 Cs-137 Contamination Delineation.** The boundaries of Cs-137 contaminated soil at the PM-2A Tanks will be located and delineated using a three-step sampling approach to identify areas with Cs-137 concentrations greater than the FRG of 23.3 pCi/g. Biased samples (determined from the results of the first two field screening sampling steps) will be taken and submitted for a 20-minute gamma spectrometric analysis to identify areas requiring excavation. Once the areas requiring excavation are identified, additional samples will be collected to obtain data for a no-longer contained-in determination. Both the radiological sampling and no-longer contained-in sampling are described in the post-ROD Field Sampling Plan (DOE-ID 2000d). The data gathered during the post-ROD sampling activities will be used to support waste disposal and identify where Cs-137 soil concentrations exceed the FRG of 23.2 pCi/g.

### **2.9.3 Fuel Leak Site (WRRTF-13)**

Diesel and fuel oil contaminants, including benzene, toluene, ethylbenzene, and xylenes and polynuclear aromatic hydrocarbons, will be identified in the Fuel Leak soil using a statistically defensible sampling design. The sampling results will be used to determine risk-based remediation goals in accordance with the State of Idaho RBCA *Guidance Document for Petroleum Releases* (IDEQ 1996a) and IDEQ *Information Series #7: Procedures for and Treatment of Petroleum Contaminated Soils* (IDEQ 1996b), and to determine land farming excavation volumes.